

What is claimed is:

1. A fusion protein, wherein the fusion protein comprises:

a) a ligand that stimulates cancer cell growth and corresponds to receptors overexpressed by cancer cells, or a screened peptide that is affinitive to or antagonist to cancer cell receptors, or a peptide that directly interacts with cancer cell surface;

b) a superantigen that may lead to anti-cancer immune response.

2. A fusion protein according to claim 1, wherein the ligand that stimulates cancer cell growth and corresponds to receptors overexpressed by cancer cells is selected from: epidermal growth factor (EGF) family, vascular endothelial cell growth factor (VEGF) family, basic fibroblast growth factor bFGF and FGF family, transforming growth factor - α (TGF- α), interleukin-4, interleukin-2, interleukin-6, interleukin-13, interleukin-3, granulocyte-macrophage colony-stimulating factor (GM-CSF), heparin-binding EGF-like growth factor (HB-EGF), insulin-like growth factor (IGF), hepatocyte growth factor (HGF), platelet-derived growth factor (PDGF), nerve growth factor (NGF), placental growth factor (PGF), stem cell factor (SCF), interleukin-8, Ephrin family, Heregulin, erbB ligand, chemokine, angiopoietin (Ang), thrombopoietin (TPO), factor VII, urokinase-type plasminogen activator (uPA), growth hormone releasing hormone, gonadotropin-releasing hormone (GRH), α -melanocyte stimulating hormone (α -MSH), gastrin-releasing peptide (GRP), prolactin (PRL), prolactin releasing hormone (PRLH), growth hormone, follicle stimulating hormone (FSH), placental lactogen (PL), chorionic gonadotropin (CG), corticotrophin releasing hormone, somatostatin, asialoglycoprotein, low density lipoprotein and transferrin, and other ligands associated with cancers or immune diseases, and their nature variants and artificial variants with more than 70% identity.

3. A fusion protein according to claim 1, wherein the superantigen that leads to anti-cancer immune response is selected from: SEA, SEB, SEC, SED, SEE from Staphylococcal enterotoxin family, SPE-A, SPE-B, SPE-C from Streptococcus toxin, viral protein and the nature and artificial variants thereof.

4. A fusion protein according to claim 1, wherein the ligand that stimulates cancer cell growth and corresponds to receptors overexpressed by cancer cells is selected from epidermal growth factor (EGF) and vascular endothelial cell growth factor (VEGF).

5. A fusion protein according to claim 1, wherein the superantigen that leads to anti-cancer immune response is SEA of Staphylococcal enterotoxin family.

6. A fusion protein according to claim 1, wherein the superantigen is SEA protein, and the ligand is selected from epidermal growth factor (EGF) and vascular endothelial cell growth factor (VEGF).

7. A recombinant vector, wherein the vector comprises the nucleotide sequence that encodes the fusion protein according to claim 1.

8. A host cell, wherein the host cell comprises the recombinant vector according to claim 7.

9. A method for producing the fusion protein according to claim 1, wherein the method comprises: culturing host cell according to claim 10, and collecting expressed fusion proteins according to claim 1.

10. The use of the fusion protein according to claim 1, in preparation therapeutic agents for cancer or immune disease treatment.